

Application Serial No. 10/765,284
Date June 1, 2005
Reply to Office Action dated March 5, 2005

Page 2 of 13

Listing of the Claims:

1. (Currently Amended) A fluid quick connector comprising:
a connector housing having a throughbore configured to mate with an endform;
a seal member mounted in the bore adapted to seal the connector housing to the endform;
a top hat mounted in the bore of the connector housing axially adjacent to the seal member, the top hat movable between a first position indicating a non-fully inserted position of the endform in the connector housing and a second position upon contact with and full insertion of the endform into the housing; and
biasing means unitarily formed on the top hat for biasing the top hat to the first position, the biasing means being movable to a position allowing sliding movement of the top hat to the second position in the bore in the housing upon contact with an endform inserted into the bore in the housing; and
retainer means, transversely mounted in the housing, for latching the endform in the housing, the retainer means movable from a first non-latching position with respect to the endform to a second latching position only when the endform has moved the top hat to the second position.
2. Canceled
3. (Currently Amended) The fluid quick connector of claim 2_1 wherein:
the biasing means is monolithically formed on the top hat.
4. (Currently Amended) The fluid quick connector of claim 2_1 wherein the biasing means comprises:
at least one spring arm.
5. (Original) The fluid quick connector of claim 4 wherein:
the spring arm is flexible.

Application Serial No. 10/765,284

Page 3 of 13

Date June 1, 2005

Reply to Office Action dated March 5, 2005

6. (Original) The fluid quick connector of claim 4 wherein the spring arm has an end portion disposed at a larger outside diameter than the diameter of the bore.

7. (Original) The fluid quick connector of claim 4 further comprising:
a notch formed in the end of the spring arm allowing radially inward flexing of the spring arm.

8. (Original) The fluid quick connector of claim 4 wherein the spring arm comprises:

a pair of spring arms

9. (Original) The fluid quick connector of claim 8 wherein the pair of spring arms are diametrically opposed on the top hat.

10. (Currently Amended) ~~The fluid quick connector of claim 4 wherein the top hat further comprises: A fluid quick connector comprising:~~

a connector housing having a throughbore configured to mate with an endform;
a seal member mounted in the bore adapted to seal the connector housing to the endform;
a top hat mounted in the bore of the connector housing axially adjacent to the seal member, the top hat movable between a first position indicating a non-fully inserted position of the endform in the connector housing and a second position upon contact with and full insertion of the endform into the housing;

retainer means, transversely mounted in the housing, for latching the endform in the housing, the retainer means movable from a first non-latching position with respect to the endform to a second latching position only when the endform has moved the top hat to the second position.

means for biasing the top hat to the first position, the biasing means including at least one spring arm movable to a position allowing sliding movement of the top hat to the second position in the bore in the housing upon contact with an endform inserted into the bore in the housing; and

Application Serial No. 10/765,284

Page 4 of 13

Date June 1, 2005

Reply to Office Action dated March 5, 2005

the top hat including a post having an end extending axially beyond the end of the spring arm.

11. (Original) The fluid quick connector of claim 10 wherein the post comprises: a pair of posts.

12. (Original) The fluid quick connector of claim 4 wherein the spring arm comprises an annular portion slidable into the bore in the housing.

13. (Original) The fluid quick connector of claim 1 wherein the top hat further comprises:

means for preventing movement of the retainer means to the second position.

14. (Original) The fluid quick connector of claim 13 wherein: the movement preventing means extends into the path of movement of the retainer means to the second position when the top hat is in the first position.

15. (Original) The fluid quick connector of claim 1 wherein: the retainer includes means for latching the retainer in a first position in the housing and allowing insertion of the endform therewith into the bore in the housing.

16. (Currently Amended) The fluid quick connector of claim 15 wherein the retainer further comprises:

inner legs having an inner diameter less smaller than the an outer diameter of the bore an enlarged flange on the endform.

17. (Original) A fluid quick connector comprising:
a connector housing having a throughbore configured to mate with an endform;
seal means disposed in the bore for sealing the connector housing to the endform;
a top hat mounted in the bore of the connector housing axially adjacent to the seal means, the top hat movable between a first position indicating a non-fully inserted position

Application Serial No. 10/765,284

Date June 1, 2005

Reply to Office Action dated March 5, 2005

Page 5 of 13

of the endform in the connector housing and a second position upon contact with and full insertion of the endform into the housing;

means, monolithically formed on the top hat, for biasing the top hat to the first position, the biasing means including a pair of spring arms carried on the top hat; and

retainer means, transversely mounted in the housing, for latching the endform in the housing, the retainer means movable from a first non-latching position with respect to the endform to a second latching position only when the endform has moved the top hat to the second position;

18. (Original) The fluid quick connector of claim 17 wherein:
the spring arms are flexible.

19. (Original) The fluid quick connector of claim 17 wherein the spring arms have end portions disposed at a larger outside diameter than the diameter of the bore.

20. (Original) The fluid quick connector of claim 17 further comprising:
a notch formed in the end of the spring arms allowing angularly inward flexing of each spring arm.

21. (Original) The fluid quick connector of claim 17 wherein:
the spring arms are diametrically opposed.

22. (Original) The fluid quick connector of claim 17 wherein the top hat further comprises:

means for preventing movement of the retainer means to the second position.

23. (Original) The fluid quick connector of claim 22 wherein:
the movement preventing means extends into the path of movement of the retainer means to the second position when the top hat is in the first position.

Application Serial No. 10/765,284

Page 6 of 13

Date June 1, 2005

Reply to Office Action dated March 5, 2005

24. (Currently Amended) The A fluid quick connector of claim 17 wherein the retainer movement preventing means comprises: comprising:

a connector housing having a throughbore configured to mate with an endform;
seal means disposed in the bore for sealing the connector housing to the endform;
a top hat mounted in the bore of the connector housing axially adjacent to the seal
means, the top hat movable between a first position indicating a non-fully inserted position
of the endform in the connector housing and a second position upon contact with and full
insertion of the endform into the housing;

means, monolithically formed on the top hat, for biasing the top hat to the first
position, the biasing means including a pair of spring arms carried on the top hat;

retainer means, transversely mounted in the housing, for latching the endform in the
housing, the retainer means movable from a first non-latching position with respect to the
endform to a second latching position only when the endform has moved the top hat to the
second position; and

means for preventing movement of the retainer means to the second position
including a pair of posts, each having an end extending axially beyond the end of the spring
arms.

25. (Original) The fluid quick connector of claim 17 wherein the spring arms comprise:

an annular portion slidable into the bore in the housing.

26. (Currently Amended) A top hat for a fluid quick connector including a housing having a throughbore configured to mate with an endform, a seal member mounted in the bore adapted to seal the housing to the endform and a retainer transversely mounted in the housing for latching the endform in the housing, the retainer moveable from a first non-latching position with respect to the endform to a second latching position latching the endform in the housing, the top hat comprising:

an annular end portion insertable into the bore in the housing;

biasing means, unitarily formed on the top hat and extending from the annular
portion, for biasing the top hat to a first position indicating a non-fully inserted position of

Application Serial No. 10/765,284

Page 7 of 13

Date June 1, 2005

Reply to Office Action dated March 5, 2005

the endform in the housing, the biasing means moveable to a position allowing sliding insertion of the top hat to a second position in the bore in the housing upon insertion of the endform in the housing; and

means, extending from the annular portion, for preventing movement of the retainer to the second position, the retainer movement preventing means extending into the path of movement of the retainer to the second position when the top hat is in the first position.

27. (Original) The top hat of claim 26 further comprising:

the biasing means disposed for angular flexing.

28. (Original) The top hat of claim 26 wherein the biasing means comprises:

an arcuate segment extending from the annular portion of the top hat; and

an radially and angularly outward extending end portion extending from the arcuate segment.

29. (Currently Amended) The top hat of claim 26 wherein the biasing means comprises: for a fluid quick connector including a housing having a throughbore configured to mate with an endform, a seal member mounted in the bore adapted to seal the housing to the endform and a retainer transversely mounted in the housing for latching the endform in the housing, the retainer moveable from a first non-latching position with respect to the endform to a second latching position latching the endform in the housing, the top hat comprising:

an annular end portion insertable into the bore in the housing;

biasing means, extending from the annular portion, for biasing the top hat to a first position indicating a non-fully inserted position of the endform in the housing, the biasing means moveable to a position allowing sliding insertion of the top hat to a second position in the bore in the housing upon insertion of the endform in the housing; and

means, extending from the annular portion, for preventing movement of the retainer to the second position, the retainer movement preventing means extending into the path of movement of the retainer to the second position when the top hat is in the first position;

the biasing means including a pair of circumferentially spaced spring arms; and

Application Serial No. 10/765,284

Page 8 of 13

Date June 1, 2005

Reply to Office Action dated March 5, 2005

the retainer movement preventing means including at least one post extending from the annular portion of the top hat, an end of the post extending axially beyond an end of the spring arms.

30. (Original) The top hat of claim 29 wherein:

the at least one post includes a pair of circumferentially spaced posts; and

the pair of spring arms and the pair of posts are alternatingly arranged about an arcuate portion of the top hat.

31. (Currently Amended) A method for preventing false sealing insertion of an endform in a fluid quick connector, the method comprising the steps of:

providing a connector housing with a bore extending from a first end;

providing a seal member in the bore;

providing a retainer moveable from a first position with respect to the housing to a second position in the housing to latch the endform in the housing;

providing a top hat mountable in the bore to maintain the seal member in the bore;

providing means for blocking movement of the retainer to the second position until the endform has been fully inserted into the bore in sealing engagement with the seal member;

forming unitary biasing means on the top hat for biasing the top hat to a first position to block movement of the retainer to the second position;

moving the top hat to the second position in the housing during contact with the endform inserted into the bore and the housing to allow the retainer to move to the second position, the second position of the top hat coinciding with the fully sealed position of the endform in the housing.

32. (Original) The method of claim 31 wherein the step of providing means for blocking movement of the retainer to the second latching position comprises the step of:

providing at least one post extending from an annular portion of the top hat, the post having an end spaced from the annular portion of the top hat extending into the path of

Application Serial No. 10/765,284

Date June 1, 2005

Reply to Office Action dated March 5, 2005

Page 9 of 13

movement of the retainer to block movement of the retainer to the second position when the top hat is in the first position.

33. (Original) The method of claim 31 wherein the step of moving the top hat to the second position comprises the steps of:

providing at least one spring arm on the top hat, the spring arm defining the means for biasing the top hat to the first position with respect to the housing.

34. (New) The fluid quick connector of claim 1 further comprising:
stop means, carried on the top hat and the connector housing, for defining end of travel limits of the top hat between the first position and the second position.

35. (New) The fluid quick connector of claim 34 wherein the stop means comprises:
a projection extending from one of the top hat and the connector housing; and
a recess formed in the other of the connector housing and the top hat and having opposed ends, the projection sliding between the opposed ends of the recess between the first and second positions of the top hat.

36. (New) The method of claim 17 further comprising:
stop means, carried on the top hat and the connector housing, for defining end of travel limits of the top hat between the first position and the second position.

37. (New) The method of claim 36 wherein the stop means comprises:
a projection extending from one of the top hat and the connector housing; and
a recess formed in the other of the connector housing and the top hat and having opposed ends, the projection sliding between the opposed ends of the recess between the first and second positions of the top hat.

Application Serial No. 10/765,284
Date June 1, 2005
Reply to Office Action dated March 5, 2005

Page 10 of 13

38. (New) The method of claim 31 further comprising:
stop means put forming stop means on the top hat in the connector means for defining, carried on the top hat and the connector housing, for defining end of travel limits of the top hat between the first position and the second position.
39. (New) The method of claim 38 wherein the set of providing the stop means comprises the steps of:
forming a projection extending from one of the top hat and the connector housing;
and
forming a recess in the other of the connector housing and the top hat and having opposed ends, the projection sliding between the opposed ends of the recess between the first and second positions of the top hat.